

CLAIMS:

We Claim:

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1. An arrangement for controlling deployment of a side airbag from an airbag module to protect an occupant in a seat of a vehicle in a crash, comprising
5 determining means for determining the position of at least a part of the occupant, and control means coupled to said determining means for controlling deployment of the side airbag based on the determined position of the at least a part of the occupant.

2. The arrangement of claim 1, wherein said determining means comprise receiver means for receiving waves from a space above a seat portion of the seat and processor means coupled to said receiver means for generating a signal representative of the position of the at least a part of the occupant based on the waves received by said receiver means.
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3. The arrangement of claim 2, wherein said receiver means comprise an ultrasonic transducer.
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4. The arrangement of claim 2, wherein said receiver means comprise at least one receiver capable of receiving electromagnetic waves.

5. The arrangement of claim 2, wherein said determining means further comprise transmitter means for transmitting waves into the space above the seat portion of the seat, said receiver means being arranged to receive the waves transmitted by said transmitter means.
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6. The arrangement of claim 5, wherein said receiver means convert received waves into electrical signals.
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7. The arrangement of claim 2, wherein said receiver means are mounted in a door of the vehicle.

8. The arrangement of claim 2, wherein said receiver means are mounted in a door of the vehicle on or adjacent to the airbag module.
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9. The arrangement of claim 1, wherein said control means control deployment of the side airbag by suppressing deployment of the side airbag, controlling the time at which deployment of the side airbag starts, controlling the rate of gas flow into the side airbag, controlling the rate of gas flow out of the side airbag or controlling the rate of deployment of the side airbag.

5 10. An arrangement for controlling deployment of a side airbag from an airbag module to protect an occupant in a seat of a vehicle in a crash, comprising
determining means for determining whether an occupant is present in the seat, and
control means coupled to said determining means for controlling deployment of the side airbag
10 based on whether an occupant is present in the seat.

11. The arrangement of claim 10, wherein said determining means comprise receiver means for receiving waves from a space above a seat portion of the seat and processor means coupled to said receiver means for generating a signal representative of the presence or absence of an occupant in the seat
15 based on the waves received by said receiver means.

12. The arrangement of claim 11, wherein said receiver means comprise an ultrasonic
transducer.

20 13. The arrangement of claim 11, wherein said receiver means comprise at least one receiver capable of receiving electromagnetic waves.

25 14. The arrangement of claim 11, wherein said determining means further comprise transmitter means for transmitting waves into the space above the seat portion of the seat, said receiver means being arranged to receive the waves transmitted by said transmitter means.

15. The arrangement of claim 14, wherein said receiver means convert received waves into electrical signals.

30 16. The arrangement of claim 11, wherein said receiver means are mounted in a door of the vehicle.

17. The arrangement of claim 11, wherein said receiver means are mounted in a door of the vehicle on or adjacent to the airbag module.

18. The arrangement of claim 10, wherein said control means suppress deployment of the side airbag if an occupant is not present.

19. The arrangement of claim 10, wherein said determining means determine the position of at least a part of the occupant when an occupant is in the seat and said control means are arranged to control deployment of the side airbag based on the determined position of at least a part of the occupant.

20. A method for controlling deployment of a side airbag from an airbag module to protect an occupant in a seat of a vehicle in a crash, comprising the steps of:

determining the position of at least a part of the occupant, and

controlling deployment of the side airbag based on the determined position of the at least a part of the occupant.

21. The method of claim 20, wherein the step of determining the position of at least a part of the occupant comprises the steps of receiving waves from a space above a seat portion of the seat and generating a signal representative of the position of the at least a part of the occupant based on the received waves.

22. The method of claim 21, wherein the step of receiving waves comprises the step of arranging an ultrasonic transducer in the vehicle in a position to receive waves from the space above the seat portion of the seat.

23. The method of claim 21, wherein the step of determining the position of at least a part of the occupant further comprises the step of transmitting waves into the space above the seat portion of the seat.

24. The method of claim 21, wherein the step of receiving waves comprises the step of mounting a transducer capable of receiving waves in a door of the vehicle in a position to receive waves from the space above the seat portion of the seat.

25. The method of claim 21, wherein the step of receiving waves comprises the step of mounting a transducer capable of receiving waves in a door of the vehicle on or adjacent to the airbag module in a position to receive waves from the space above the seat portion of the seat.

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26. The method of claim 21, wherein the step of receiving waves comprises the step of arranging a receiver capable of receiving electromagnetic waves in the vehicle in a position to receive electromagnetic waves from the space above the seat portion of the seat.

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27. The method of claim 20, wherein the step of controlling deployment of the side airbag comprises at least one of the steps of suppressing deployment of the side airbag, controlling the time at which deployment of the side airbag starts, controlling the rate of gas flow into the side airbag, controlling the rate of gas flow out of the side airbag and controlling the rate of deployment of the side airbag.

15 28. A method for controlling deployment of a side airbag from an airbag module to protect an occupant in a seat of a vehicle in a crash, comprising the steps of:
determining whether an occupant is present in the seat, and
controlling deployment of the side airbag based on the presence or absence of an occupant in the seat.

20 29. The method of claim 28, wherein the step of determining whether an occupant is present in the seat comprises the steps of receiving waves from a space above a seat portion of the seat and generating a signal representative of the presence or absence of an occupant in the seat based on the received waves.

25 30. The method of claim 29, wherein the step of receiving waves comprises the step of arranging an ultrasonic transducer in the vehicle in a position to receive waves from the space above the seat portion of the seat.

30 31. The method of claim 29, wherein the step of determining whether an occupant is present in the seat further comprises the step of transmitting waves into the space above the seat portion of the seat.

32. The method of claim 29, wherein the step of receiving waves comprises the step of mounting a transducer capable of receiving waves in a door of the vehicle in a position to receive waves from the space above the seat portion of the seat.

5 33. The method of claim 29, wherein the step of receiving waves comprises the step of mounting a transducer capable of receiving waves in a door of the vehicle on or adjacent to the airbag module in a position to receive waves from the space above the seat portion of the seat.

10 34. The method of claim 29, wherein the step of receiving waves comprises the step of arranging a receiver capable of receiving electromagnetic waves in the vehicle in a position to receive electromagnetic waves from the space above the seat portion of the seat.

15 *Sub 23* 35. The method of claim 28, wherein the step of controlling deployment of the side airbag comprises at least one of the steps of suppressing deployment of the side airbag, controlling the time at which deployment of the side airbag starts, controlling the rate of gas flow into the side airbag, controlling the rate of gas flow out of the side airbag and controlling the rate of deployment of the side airbag.

20 36. The method of claim 28, further comprising the steps of:
determining the position of at least a part of the occupant when an occupant is in the seat, and
controlling deployment of the side airbag based on the determined position of at least a part of the occupant.

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